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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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| 09/421,043 | 10/20/99 | MASUDA | T 503.34403VP2 |

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EXAMINER

ALEJANDRO MULERO, L

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1763

DATE MAILED:

06/19/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/421,043

Applicant(s)

MASUDA ET AL.

Examiner

Luz L. Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claims ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☒ received in Application No. (Series Code / Serial Number) 08/611,758.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 18) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Redeker et al. U.S. Patent 5,800,621 in view of Hama et al. U.S. Patent 5,716,451.

Redeker et al. shows the invention as claimed including a plasma processing apparatus comprising: a vacuum vessel 12; gas supply means 300; an electrostatic chuck 18; a lower electrode 28 to which a bias power source is connected (col. 3, lines 44-49); an antenna 40 including a plate-shaped conductor 75, wherein the conductor opposes the lower electrode; a plate 14 contacted with the conductor (see figure 1 and col. 4, lines 11-17); a sidewall which is under temperature control through a heater 49 (see col. 4, lines 39-41); and a ring 10 provided on an outer periphery side of the plate (see figure 1 and col. 3, lines 10-14). The ring is made of a dielectric material such as quartz or Al₂O₃ or the like, such materials have compositions of plasma gases conventionally used in plasma processes.

Redeker et al. lacks anticipation of showing the antenna being provided within the vacuum vessel.

Hama et al. discloses a plasma processing apparatus having an antenna structure arranged inside the process room to effectively transmit the RF power to the

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inside of the process room for generating a plasma with a higher density (see figure 1; col. 7, lines 27-37, and col. 13, lines 28-35 and 47-52). In view of this disclosure, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Redeker et al. as to arrange the antenna structure inside the vacuum vessel because in such way RF power can be effectively transmitted to the inside of the vacuum vessel and a plasma with a higher density can be generated.

With respect to the claimed distance between the plate and the substrate ranging from 30-150 mm (claim 4), Redeker et al. further disclose a movable platform 32 to lift and lower the substrate. Therefore, the distance between the plate and the substrate may be adjusted depending on the characteristics of the process to be performed in the apparatus. Also, such limitation is directed to a method limitation which is view^{ed} as an intended use that do^{es} not further limit, and therefore do^{es} not patentably distinguish the claimed invention.

Claims 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Redeker et al. U.S. Patent 5,800,621 in view of Hama et al. U.S. Patent 5,716,451 as applied to claims 1, 3-4 and 6 above, and further in view of Shang et al. U.S. Patent 6,055,927.

Redeker et al. and Hama et al. are applied as above but lack anticipation of showing a temperature control means in which a heating medium is used.

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Shang et al. show a plasma processing apparatus in which the walls 70 of the chamber 10 are heated by using a heated gas or liquid, such as water, from a recirculating fluid supply 61 (see figure 1 and col. 4-line 66 to col. 5-line 17). Also note that Shang et al. clearly stated that the walls of the process chamber may be heated in number of ways, such as by resistive heaters thermally coupled to the walls, and that the method is not critical (see col. 4, lines 61-65). In view of this disclosure, it would have been an obvious choice of design to one having skill in the art at the time the invention was made to modify the apparatus of Redeker et al. and Hama et al. as to comprise a heating medium supply means for heating the chamber walls because such means is conventional in the art and because the method by which the walls are heated is not critical as taught by Shang et al..

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Paranjpe et al. U.S. Patent 5591493, Miyamoto U.S. Patent 5846331, Collins et al. U.S. Patent 6024826, Yokogawa et al. U.S. Patent 5891252, Collins et al U.S. Patent 6054013, Ohmi U.S. Patent 5272417 and Ishizuka et al. U.S. Patent 5531834, show the state of the art as applied to the claimed plasma processing apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 703-305-

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4545. The examiner can normally be reached on Monday-Thursday from 8:30 to 6:00.

The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory L. Mills, can be reached on (703) 308-1633. The fax phone number for the organization where this application or proceeding is assigned is 703-305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

GREGORY MILLS
PRIMARY EXAMINER
SPB 1763



LLAM

June 15, 2000